AMENDMENTS TO THE CLAIMS

The listing of the claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A method for analyzing multivariate images, comprising:

a) providing a data matrix **D** containing measured spectral data,

b) transforming the data matrix **D**, using a wavelet transform, to obtain a transformed data matrix $\tilde{\mathbf{D}}$,

c) thresholding the wavelet coefficients of the transformed data matrix $\tilde{\mathbf{D}}$,

~~c)~~ d) performing an image analysis on the transformed data matrix $\tilde{\mathbf{D}}$ to obtain a ~~transformed~~ spatially compressed concentration matrix $\tilde{\mathbf{C}}$ and a spectral shapes matrix **S**, and

~~d)~~ e) computing a concentration matrix **C** from the ~~transformed~~ spatially compressed concentration matrix $\tilde{\mathbf{C}}$.

2. (currently amended): The method of Claim 1, wherein the data matrix **D** comprises a total of j blocks of data $\mathbf{D}_i$, each data block $\mathbf{D}_i$ thereby providing a concentration block $\mathbf{C}_i$ in step [[a)]] e), and wherein steps a) through [[d)]] e) are repeated sequentially until the concentration matrix **C** is accumulated blockwise, according to $\mathbf{C} = \left[\mathbf{C}_1 \quad \mathbf{C}_2 \quad \cdots \quad \mathbf{C}_{j-1} \quad \mathbf{C}_j\right]$.

3. (original): The method of Claim 1, wherein the wavelet transform comprises a Haar transform.

4. (canceled)

5. (currently amended): The method of Claim [[4]] 1, wherein the thresholding comprises decimating the detail coefficients.

6. (currently amended): The method of Claim 1, wherein the image analysis of step [[c)]] d) comprises an alternating least squares analysis and the ~~transformed~~

spatially compressed concentration matrix $\tilde{\mathbf{C}}$ and the spectral shapes matrix **S** are obtained from a constrained least squares solution of $\min_{\tilde{\mathbf{C}},\mathbf{S}} \left\| \tilde{\mathbf{D}} - \tilde{\mathbf{C}}\mathbf{S}^T \right\|_F$.

7. (original): The method of Claim 6, wherein the alternating least squares analysis comprises a transformed non-negativity constraint.

8. (currently amended): The method of Claim 1, wherein the computing step [[d)]] e) comprises applying an inverse wavelet transform to the ~~transformed~~ spatially compressed concentration matrix $\tilde{\mathbf{C}}$ to provide the concentration matrix **C**.

9. (currently amended): The method of Claim 1, wherein the computing step [[d)]] e) comprises projecting the data matrix **D** from step a) onto the spectral shapes matrix **S** from step [[c)]] d), according to $\min_{\mathbf{C}} \left\| \mathbf{D} - \mathbf{C}\mathbf{S}^T \right\|_F$.

10. (currently amended): A method for analyzing multivariate images, comprising:

a) providing a data factor matrix **A** and a data factor matrix **B** obtained from a factorization of measured spectral data **D**,

b) transforming the data factor matrix **A**, using a wavelet transform, to obtain a transformed data factor matrix $\tilde{\mathbf{A}}$,

c) thresholding the wavelet coefficients of the transformed data factor matrix $\tilde{\mathbf{A}}$,

~~c)~~ d) performing an image analysis on the transformed data factor matrix $\tilde{\mathbf{A}}$ and data factor matrix **B** to obtain a ~~transformed~~ spatially compressed concentration matrix $\tilde{\mathbf{C}}$ and a spectral shapes matrix **S**, and

~~d)~~ e) computing a concentration matrix **C** from the ~~transformed~~ spatially compressed concentration matrix $\tilde{\mathbf{C}}$.

11. (currently amended): The method of Claim 10, wherein the data factor matrix **A** comprises a total of *j* blocks of data factors $\mathbf{A}_i$ and the data factor matrix **B** comprises *k* blocks of data factors $\mathbf{B}_i$, thereby providing a concentration block $\mathbf{C}_i$

in step [[d)]] e), and wherein steps a) through [[d)]] e) are repeated sequentially until the concentration matrix **C** is accumulated blockwise, according to $\mathbf{C} = \left[\mathbf{C}_1 \quad \mathbf{C}_2 \quad \cdots \quad \mathbf{C}_{j-1} \quad \mathbf{C}_j\right]$.

12. (original): The method of Claim 10, wherein the wavelet transform comprises a Haar transform.

13. (canceled)

14. (currently amended): The method of Claim [[13]] 10, wherein the thresholding comprises decimating the detail coefficients.

15. (currently amended): The method of Claim 10, wherein the image analysis of step [[c)]] d) comprises an alternating least squares analysis and the ~~transformed~~ spatially compressed concentration matrix $\tilde{\mathbf{C}}$ and the spectral shapes matrix **S** are obtained from a constrained least squares solution of $\min_{\tilde{\mathbf{C}},\mathbf{S}} \left\| \tilde{\mathbf{A}}\mathbf{B}^T - \tilde{\mathbf{C}}\mathbf{S}^T \right\|_F$.

16. (original): The method of Claim 15, wherein the alternating least squares analysis comprises a transformed non-negativity constraint.

17. (currently amended): The method of Claim 10, wherein the computing step [[d)]] e) comprises applying an inverse wavelet transform to the ~~transformed~~ spatially compressed concentration matrix $\tilde{\mathbf{C}}$ to provide the concentration matrix **C**.

18. (currently amended): The method of Claim 10, wherein the computing step [[d)]] e) comprises projecting the product of the data factor matrix **A** and the data factor matrix **B** from step a) onto the spectral shapes matrix **S** from step [[c)]] d), according to $\min_{\mathbf{C}} \left\| \mathbf{A}\mathbf{B}^T - \mathbf{C}\mathbf{S}^T \right\|_F$ and subject to appropriate constraints.

19. (original): The method of Claim 10, wherein the data factor matrix **A** comprises a scores matrix **T** and the data factor matrix **B** comprises a loadings matrix **P**, and wherein **T** and **P** are obtained from a principal components analysis of the measured spectral data **D**, according to $\mathbf{D} = \mathbf{T}\mathbf{P}^T$.

20. (original): The method of Claim 19, wherein **T** and **P** represent the significant components of the principal components.

21. (new): The method of Claim 1, wherein the data matrix **D** is weighted.

22. (new): The method of Claim 10, wherein the data factor matrix **A** and the data factor matrix **B** are weighted.